

THE Paris Exposition of Practical Insectology was opened last Sunday on the terrace of the Tuileries Gardens, although the preparations are far from being completed. It promises to be an interesting and successful undertaking.

It is well known that among the first enterprises in the form of original research undertaken by the Smithsonian Institution, was the organisation of a body of correspondents in meteorology for the purpose of securing reliable data in regard to the climatology of North America. This work was prosecuted as thoroughly as the means of the Institution would permit, and was conducted with unintermitting zeal from about 1848 until within a few years past, when the expenditure of ample means by the Signal Service for the same purpose rendered it unnecessary for the Institution to continue its efforts. A period of full twenty-five years or a quarter of a century is embraced in these records. The Institution has recently been engaged in working up and discussing these results for the purpose of obtaining reliable laws in regard to American climatology. Several years since this material was drawn upon by Prof. Coffin in the preparation of his work on the "Winds of the Northern Hemisphere," and published by the Smithsonian Institution. This was followed a few years subsequently by the publication of the tables of rain-fall prepared by C. A. Schott. We now have to report the appearance of a third volume of the series, that of the "Atmospheric Temperature," forming a work of about 360 pages, illustrated by three plates, one showing the summer temperatures, one those of winter, and one the means of the year. The new edition of the work on the winds, commenced by Prof. Coffin, and finished after his death by his son, with the assistance of Prof. Wojcikoff, will, it is understood, make its appearance in a short time.

The fourth number of the second volume of the *Bulletin* of the Geological and Geographical Survey of the Territories is occupied by several zoological papers by Mr. J. A. Allen, of Cambridge. The most important of these is one upon "The Geographical Variation among North American Mammals, especially in respect to Size." Referring to the generalisation that was made some years ago, that the American Mammals as well as birds increase in size with the latitude of their birth-place, as also with altitude, Mr. Allen remarks that this does not apply in the case of some of the carnivora, and that the following propositions more nearly express the facts: 1. The maximum physical development of the individual is attained where the conditions of environment are most favourable to the life of the species. 2. The largest species of a group (genus, sub-family, or family, as the case may be) are found where the group to which they severally belong reaches its highest development, or where it has what may be termed its centre of distribution. 3. The most "typical," or most generalised representatives of a group are found also near its centre of distribution, outlying forms being generally more or less "aberrant" or specialised.

A COMMISSION composed of members of the Institute and other men of science has been appointed by M. Teisserene de Borg, the French Minister of Commerce and Agriculture, to draw up the regulations for the National School of Agriculture which has been re-established by a vote of the Senate. That establishment was abolished by Napoleon III. in the beginning of his reign; it was created by the French Republic of 1848.

M. NADAULT DE BUEFON, a French *savant*, has sent to the Society of Acclimatisation, through M. Drouyn de Lhuys, the herbarium collected by Daubenton, the great friend of his illustrious ancestor. The herbarium was collected at Montbard, when Daubenton was busy in the erection of a sheep-house, which led to the introduction into France of the first *merinos*.

A NOTEWORTHY feature in the *Iowa Weather Review* for June, No. 6, is the five weather maps accompanying it—one showing the position of the ninety-seven stations now established in the State, while the other four show the distribution of the rainfall during each of the three decades of May and during the whole month. Dr. Heinrichs aims at establishing other twenty-two stations in order to secure that the greatest distance between any two stations shall not reach fifty miles, and about 100 stations for rainfall and other non-instrumental observations which he properly regards as necessary for an accurate study of the atmospheric conditions of Iowa. A rapid summary of the weather of March, April, and May, with tabular matter, in several respects of an original and highly practical character, completes an interesting number.

WE have on our table the following books:—"The Law of Storms, considered Practically," W. H. Rosser (Charles Wilson). "The Yorkshire Lias," Ralph Tate and J. F. Blake (Van Voorst). "Wine and its Counterfeits," James L. Denman. "The Sun; Ruler of the Planetary System," third edition, Richard A. Proctor (Longman). Arnott's "Elements of Physics," seventh edition, edited by Bain and Taylor (Longmans). "The Andes and the Amazons," James Orton (Harper Brothers). "Comparative Zoology," James Orton (Harper Brothers). "On Mixed Languages," J. C. Clough (Longmans). "Weather Charts and Storm Warnings," R. H. Scott, F.R.S. (H. S. King and Co.). "Geological Survey of Canada for 1874-5." "Lectures on Astronomical Theories" (John Harris). "Dental Student's Note-Book," Oakley Coles (G. Butcher). "United States Geological Survey," Vols. ix. and x. The following German works may be had in London from Messrs. Williams and Norgate:—"Lehrbuch der Pathologischen Anatomie," von Dr. F. v. Birch-Hirschfeld, Erste Hälfte (Leipzig, F. C. W. Vogel); "Handbuch der Zoologie," von Gustav von Hayek (Wien, Carl Gerold's Sohn).

THE latest additions to the Royal Aquarium, Westminster, include the following:—John Dorey (*Zeus faber*), Scad, or Horse Mackerel (*Trachurus trachurus*), Small-mouthed Wrass (*Acantholabrus exoletus*), Gemmeous Dragonets (*Callionymus lyra*), Sea Sticklebacks (*Gasterosteus spinachia*), Red Bream (*Pagellus centrodontus*), Three-bearded Rockling (*Motella mustela*), Large Spider Crabs (*Mair squinado*), Mexican Axolotl (*Axolotles guttatus*), presented by Mr. Jabez Hogg.

THE additions to the Zoological Society's Gardens during the past week include two Green Monkeys (*Cercopithecus callitrichus*) from West Africa, presented by Mr. Henry Richardson; a Sloth Bear (*Melursus labiatus*) from India, presented by Messrs. Royle and Gray, Lieutenants R.N.; two Russell's Vipers (*Vipera russelli*) from Ceylon, presented by Mr. Henry S. Saunders; three Dark-green Snakes (*Zamenis atrovirens*), four Dahl's Snakes (*Zamenis dahl*), a Clifford's Snake (*Zamenis cliffordi*) from Dalmatia, presented by Lord Lilford; a Hoffmann's Sloth (*Choloepus hoffmanni*) from Panama, deposited; a Macaque Monkey (*Macacus cynomolgus*), born in the Gardens.

SCIENTIFIC SERIALS

PART 4 of vol. xxvi. of the *Zeitschrift für Wissenschaftliche Zoologie* (March, 1876) opens with a long communication from O. Bütschli on the free Nematodes and on the Gastrotrichous genus *Chaetonotus*. He gives many additional particulars respecting forms already made known by Bastian and others. He comes to the conclusion that the Gastrotricha are intimately related to Dujardin's genus *Echinoderes*; and he combines them into a group *Nematorhyncha*. He then considers the relations of these forms to Vermes and Arthropods, and constructs a supposed phylogenetic tree. The paper is beautifully illustrated.—Dr. Hermann von Ihering has a controversial article on the development of *Cyclas* and the homology of the blastodermic

layers in Mollusca. He especially calls in question the observations of Ray Lankester, Haeckel, and Ganin, and approves the modified form of the Gastræa theory no more than the original.—F. E. Helm describes in detail the silk-glands of Lepidoptera, and their retrogressive changes after full function.—Herbert Ludwig, giving an account of the formation of the blastoderm of spiders, states that his observations are in entire accordance with Haeckel's views.

Gegenbaur's Morphologisches Jahrbuch.—Part 3 opens with a long and important communication by Oscar Hertwig on the formation, fecundation, and division of the ovum in the Echinid *Toxopneustes lividus*. He considers chiefly the fate of the germinal vesicle and the connection between it and the subsequent development of the ovum. From his observations he supposes that when the germinal vesicle is resolved the germinal spot is saved and gets to the centre of the ovum; he finds that a nuclear body which may be the head of the spermatozoon approaches this and coalesces with it, and that the resulting body assumes an hour-glass shape and finally divides into two, and really originates the cleavage of the ovum. Unfortunately the author has to make assumptions at the most critical points, and consequently his views cannot be accepted without confirmation.—Dr. G. Born has a contribution on the sixth toe of Anura, referring to the cartilages considered by Cuvier and Meckel as a rudiment of a sixth member of the hind limb. Another lengthy memoir in this part is by R. Wiedersheim on the anatomy of *Phyllodactylus europæus*, a member of the group of lizards of which the gecko is the type, found in the Island of Sardinia, as well as in the islet Tinetto, on the western horn of the Gulf of Spezia. He considers very fully the relation of the *aqueductus vestibuli* to the *sacculus endolymphaticus* in the Ascalabota generally.

In Part 4 Dr. B. Gabriel describes a new genus and species of Rhizopod living in moist earth about the roots of mosses. This form, which he names *Troglodytes zoster*, has a shell-like investment and emits pseudopodia at one pole only. The life-history of this form has been traced, and it is of great interest. Two adult specimens conjugate by their pseudopodia and afterwards separate; this is followed by an encysted stage, during which a large number of minute granules grow up into germs which are liberated from the investment, and grow up into a minute monostigma form. These germs subsequently conjugate in pairs constituting a diplostigma, and ultimately they slowly coalesce, and then assume the parent form.—T. W. Engelmann has an elaborate article on development and reproduction in Infusoria, in which he gives an account of the stages of *Opalina ranarum* and of budding and conjugation in Vorticella and Epistylis. He further examines and criticises many observations of other authors, and some of his principal conclusions are as follows:—That the conjugation of Infusoria does not lead to reproduction by means of ova, but to a peculiar development of the conjugated individuals, which he terms reorganisation; that the nucleus, neither in conjugation nor in any other circumstance, plays the part of a germ-producing organ; that its significance is merely that of an ordinary cell-nucleus.—Max Fürbringer continues his monograph on the comparative anatomy of the shoulder-muscles, by a chapter of 180 pages, on the bony shoulder-girdle and sternum, the brachial plexus, and the muscles related to the shoulder in Lacertilia and Crocodilia.

SOCIETIES AND ACADEMIES

PHILADELPHIA

Academy of Natural Sciences.—Session 1875-6.—Prof. Cope's contributions to palæontology and philosophic biology have been numerous and important. In successive communications he has given accounts of the Eocene mammals of the Rocky Mountains, possessing characters which at first led to their being assigned to the Carnivora. Prof. Cope has demonstrated their insectivorous affinities, but finds that the definition of existing insectivora is insufficient to include them. Other forms supposed at first to be of lemurine affinities are found to be yet more generalised, and to range with the previously mentioned animals. He proposes the name Bunotheria for the order, with sub-orders Creodonta, Mesodonta, Insectivora, Tillodonta, and Tæniodonta (*Proc.* 1876, p. 88). Prof. Cope has also endeavoured to equate the North American Eocene to the European zones. The Bridger formation of S.W. Wyoming he calls Middle Eocene, characterised by Palæosyops, Tillodonta, and Dinocerata; and the Wahsatch group in N.E. New Mexico and S.W. Wyoming

is assigned to the Lower Eocene, with Coryphodon, Tæniodonta, Phenacodus, and Diatryma.—Mr. Robert Ridgway contributed (*Proc.* 1875, p. 470) a valuable monograph on the North American hawks of the genus *Micrastur*. An examination of the perplexingly-various plumage shows that there is no appreciable sexual difference; there are two well-marked growth-stages with plumage distinctions; certain species are notably dimorphous, some deeply rufescent, others clear plumbeous, without reference to age, sex, or season.—Other contributions to zoology include the establishment of a new genus of Procyonidæ from Costa Rica, by Mr. J. A. Allen; observations on the habits of manatees kept in confinement in the Zoological Garden at Philadelphia, by Dr. H. C. Chapman; Dr. Wilder on fishes' brains, and Prof. Leidy on Rhizopods, and Mr. H. K. Morrison on American Noctuidæ.—Dr. Isaac Lea has continued his researches on the microscopic structure of gems, and has found that in addition to the internal crystalline forms which they possess, there are in most gems, cavities, often tens of thousands in number.—Mr. George Hay, in his chemical contributions gives an account of the decomposition of stannous chloride vapour in a Geissler's tube; and of the solubility of tin, arsenic, and antimony in concentrated nitric acid at 36° F., when the oxidation is in the ratio of their several volatilities.—Prof. Persifor Frazer and Dr. Koenig have been the principal contributors in geology and mineralogy.—Mr. Thomas Meehan among several botanical notices has given accounts of interesting hybrids, of certain insectivorous plants, and of a certain maple tree which flourished although all its leaves became reversed, so as to expose its stomata to direct sunlight. The propagation of *Tillandsia usneoides*, the epiphytic, not parasitic Florida or Spanish moss was described as being principally by means of small branches scattered during storms or by other means, but very rarely by seeds.—An interesting observation was made on the large number of cases in which double Chinese peaches of the season 1875 bore two or three fruits on each flower; thus showing their solidarity with the polycarpellary Rosacæ.

VIENNA

Imperial Academy of Sciences, March 9.—On the nature of the soft or half liquid state of aggregation; on regelation and recrystallisation, by M. Pfaunder. After dividing the bodies in question into mixtures of small solid parts with true liquids, soft bodies proper, containing no dissimilar parts, and mixtures of the two classes, he gives a hypothesis on the process of melting and the soft state. The common ideal melting process, where the temperature remains the same from beginning to end, is not according to fact. The mean temperature of the body beginning to melt is about $t + t'$ lower than that of the already melted mass, if $\pm t$ and $\pm t'$ denote the amounts of divergence of temperature of the separate molecules in the solid and liquid condition. Hence the true melting point is different from the temperature at the beginning and the end of the melting process. M. Pfaunder extends his hypothesis to soft bodies of compound nature, and to regelation and recrystallisation.—On the difference of tension between the left ventricle and the aorta, by M. Gradle. The blood pressure in the aorta is usually higher than the maximal pressure in the left ventricle. The difference disappears when the points of the semilunar valves are torn through.—On the physical nature of vegetable protoplasm, by M. Velten. The retention of form (in hair cells, leaf cells, &c.) and simultaneous mobility of particles, indicate that at least two bodies with different aggregate states exist in protoplasm. The dense parts do not envelop the liquid parts, but solid and liquid particles are arranged beside each other in small spaces. In considering the ball formation of plasma, which is the principal argument for its liquid nature, M. Velten distinguishes normal and abnormal ball formations; the former could not prove the viscous nature of plasma, while the latter unmistakably point to a semi-liquid state of aggregation of the whole body.—On nitro-glycerine and the most important nitro-glycerine preparations, by M. Beckerlin.—On the condition of heat equilibrium of a system of bodies with reference to gravity, by M. Loschmidt. Gravitation affects only the vertical component of molecular velocity, leaving the horizontal untouched; this destroys the symmetry of distribution of velocity in gases.—Communications from the Mineralogical Museum of the University, by M. Schrauf. This relates to certain minerals from the graphite deposits of Mugrau.

March 16.—On the influence of temperature on galvanic conduction of tellurium, by M. Exner. The alteration of conductivity through heat is due to a change of molecular structure;